



# Fertility Outcomes After Reversal of Tubal Sterilisation

## Tubal Reanastamoz Sonrası Fertilité Sonuçları

Tubal Reversal

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### Özet

**Amaç:** Bu çalışmada laparoskopik ve laparotomik tubal reanastamoz operasyonu geçirmiş hastaların tubal reanastamoz isteklerinin nedenlerini ortaya konulması ve fertilité sonuçlarının değerlendirilmesi amaçlandı. **Gereç ve Yöntem:** Bu retrospektif çalışmaya kliniğimizde Ocak 2008- Haziran 2015 tarihleri arasında tubal reanastamoz operasyonu geçirmiş olan 36 hasta dahil edilmiştir. Laparoskopik tubal reanastamoz operasyonu geçirmiş olan 7 ve laparotomi ile tubal reanastamoz operasyonu geçirmiş olan 29 hastanın verileri analiz edilmiştir. Her hastanın sterilizasyon zamanındaki yaşları, reanastamoz yaşları, vücut kitle indeksleri (VKİ), sigara kullanımı, alkol kullanımı, geçirilmiş pelvik cerrahi, subfertilité öyküsü, ek hastalık varlığı, bilinen erkek infertilitesi varlığı, demografik özellikleri, hormon profilleri, Histerosalpingografi (HSG) sonuçları, uygulanmış sterilizasyon yöntemi, reanastamoz yöntemi, tubal reanastamoz isteme nedeni verileri kaydedildi. Laparoskopik reanastamoz uygulanan 7 hasta (Grup 1) ve laparotomi uygulanan 29 hasta (Grup 2) fertilité sonuçları açısından değerlendirildi. **Bulgular:** Hastaların ortalama 2 yıllık takipleri sonucunda; laparotomik reanastamoz grubunda 20 (%69)'sinde gebelik oluşmadı, 4 (%13.8)'ü abortus, 1 (%3.4)'i ektopik gebelik ve 4 (%13.8)'ü canlı doğum ile sonuçlandı. Laparoskopik reanastamoz yapılanların 5 (%71.4)'inde gebelik oluşmazken, 1 (%14.3)'i ektopik gebelik ve 1 (%14.3)'i canlı doğum ile sonuçlandı. **Tartışma:** Tubal reanastamoz öncesinde hastadan ayrıntılı bir anamnez alınması, tubal sterilizasyon operasyon verilerine ulaşılması, hastaya laparoskopik yöntemin minimal invaziv bir seçenek olarak sunulması gerekir. Gebelik olasılığı hakkında fikir yürütürken hastanın yaşı, vücut kitle indeksi, ek hastalıkları ve fertilitéyi etkileyen diğer faktörlerin gözönüne alınması gereklidir. Olgu sayısı sınırlı olmakla beraber bu çalışmadaki sonuçlar laparoskopik tubal reanastamozun oldukça güvenilir ve etkin bir yöntem olduğunu düşündürmektedir.

### Anahtar Kelimeler

Tubal Reanastamoz; Fertilité; Laparoskopi

### Abstract

**Aim:** The aim of this study was to reveal the reasons why women request reversal of tubal sterilisation and to compare surgical techniques in terms of fertility outcomes. **Material and Method:** This retrospective study included 36 patients, who underwent tubal reanastomosis surgery in our clinic between January 2008- June 2015. Analysis was made of laparoscopic tubal reanastomosis applied to 7 patients and of reanastomosis applied with laparotomy to 29 patients. For each patient, data were recorded on age at the time of sterilization, age at the time of reversal, body mass index, smoking use, alcohol use, pelvic surgery history, subfertility, additional diseases, known male infertility, demographics, hormone profiles, hysterosalpingography (HSG) results, applied sterilization methods, reversal methods, and the reasons for requesting tubal reversal. The fertility outcomes were evaluated. **Results:** At the end of mean 2 years follow-up of patients, in the laparotomy group, 20 (69%) patients had not achieved pregnancy, 4 (13.8%) had abortus, 1 (3.4%) had an ectopic pregnancy and 4 (13.8%) patients had live births. In the laparoscopic group, pregnancy was not achieved in 5 patients (71.4%), 1 (%) was complicated with ectopic pregnancy, and 1 (14.3%) had a live birth. **Discussion:** Before reversal of tubal sterilisation, a detailed patient history should be taken, the data of the sterilization operation should be accessed, and laparoscopic surgery must be presented to the patient as an option. When considering the probability of pregnancy, the patients's age, BMI, additional diseases, and other factors that affect fertility must be taken into consideration. Although the number of cases was limited, the results of this study support the view that laparoscopic tubal reanastomosis is a safe and effective procedure.

### Keywords

Tubal Reversal; Fertility; Laparoscopy

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## Introduction

Tubal sterilisation is a contraception method widely used throughout the world [1]. The most important reason for the selection of this method is that it is permanent. However, several studies have shown that for various reasons, 1%-3% of couples make the decision for reanastomosis [2]. When the reasons for wanting reanastomosis are examined, the most common reasons are regret at having decided on sterilisation at a young age, that they have only 1 or 2 children, loss of a child, remarriage, low socio-economic level, and low level of education [1, 3]. Rather than reanastomosis, some couples prefer in vitro fertilisation (IVF). The American Productive Health and Infertility Association presented reanastomosis as a choice for fertility after tubal sterilisation and reported the most important prognostic factor to be age [4]. In literature, the demand for reanastomosis has been reported as 14.3% with operations carried out at the rate of 1.1% [5]. Tubal reanastomosis procedures were first reported with laparotomy by Gomel V in 1974 and with laparoscopy [6] by Sedbon E et al in 1989 [7]. In a study comparing tubal reanastomosis applied with laparotomy and laparoscopy, pregnancy rates of 55%-90% in the laparotomy group and 25%-73% in the laparoscopy group were reported [1, 8]. Theoretically, increased risks of adhesion, pelvic wall retraction, and intestinal adhesions in the laparotomy group have been reported [9,10].

Laparoscopic tubal reanastomosis is applied successfully with the advantages of minimally invasive surgery. Currently, robotic surgery is used for tubal reanastomosis because of the advantages provided of maximum rotation and an approach at the desired angle to the tubal tissue.

The aim of this study was to reveal the reasons for requesting tubal reanastomosis of patients who underwent laparoscopic or laparotomic tubal reanastomosis surgery in our clinic between 2008- 2015 and to evaluate the postoperative fertility outcomes in the light of current literature.

## Material and Method

This retrospective study included 36 patients who underwent tubal reanastomosis surgery in our clinic between January 2008-June 2015. The study was designed retrospectively; a total of 56 patients were contacted and of these, the data of 36 were analysed, comprising 7 who underwent laparoscopic tubal reanastomosis and 29 who underwent tubal reanastomosis with laparotomy. No patient had known infertility. A record was made for each patient of the age at sterilisation, the age at reanastomosis, height, weight, tobacco and alcohol use, previous pelvic surgery, history of subfertility, additional diseases (diabetes mellitus [DM], hypertension, thyroid disease, etc.), male infertility, demographic characteristics, levels of follicle stimulating hormone (FSH), luteinising hormone (LH), thyroid stimulating hormone (TSH) and prolactin hormone (PRL), results of hysterosalpingography (HSG), the sterilisation method applied, the reanastomosis method, and the reason for requesting reanastomosis. Patients determined intra-operatively with >5cm tubal length, and those who underwent unilateral surgery for reasons such as adhesions, etc. were excluded from the study. In the laparoscopy group, all the operations were performed by a single specialist and in the laparotomy group, 3 experienced

specialists used the same method on all the patients.

The patients were separated into 2 groups as Group 1 who underwent laparoscopic reanastomosis and Group 2 who underwent laparotomy. According to the fertility outcomes after reanastomosis, the patients were evaluated in 4 categories as 1 =unsuccessful result, 2= abortus, 3 =ectopic pregnancy and 4=live birth. Patients who could not become pregnant were included in category 1 as an unsuccessful result, those whose pregnancy was terminated before 20 weeks as category 2 abortus, those with a confirmed diagnosis of ectopic pregnancy as category 3 ectopic pregnancy, and those who gave birth above the viability limit as category 4, live birth.

## Statistical Analysis

The data obtained in the study were evaluated with SPSS 21 computer software (Statistical Package for the Social Sciences, Chicago, USA). Descriptive statistics were shown as mean, standard deviation, number, and percentage distribution. The Mann Whitney U-test and the Fisher test were used in the comparisons.

## Results

Of the 36 patients evaluated, laparotomic reanastomosis was applied to 29 (Group 1) and laparoscopic reanastomosis to 7 (Group 2). The time at the age of sterilisation was 29.04±6.15 years in Group 1 and 28.80±5.97 years in Group 2. There was no known male infertility in any case. The patient characteristics are shown in Table 1. No statistically significant difference was determined between the groups. From the total patient group, Type 2 DM and hypertension were determined in 2 patients. No complications developed in any patient of the laparoscopy group and wound site infection developed in 6 patients of the laparotomy group.

Table 1. The characteristic properties of the patients

	L/T (n=29)	L/S (n=7)	p value
Sterilisation age	29.04±6.15	28.80±5.97	0.591
Reanastomosis age	36±4.25	36.6±2.60	0.968
Sterilisation-Reanastomosis time difference (year)	6.60±4.19	7.80±4.43	0.241
Gravida	5±2.59	5±3.31	0.809
Parite	3.8±1.36	4.4±3.28	0.501
BMI (kg/m2)	28.56±5.50	29.47±9.28	0.562
FSH (mIU/ml)	6.1±2.97	5.35±0.58	0.247
Partner age	42.85±4.73	40±4.50	0.175
TSH (µU/ml)	1.87±0.97	1.12±0.25	0.080
Cigarette (%)			
Yes	9(%31)	2(%28.6)	
No	20(%69)	5(%71.4)	0.900
Sterilisation technique			
L/T pomeroy	26(%89.7)	7(%100)	
L/S bipolar	3(%10.3)	0(%0)	0.381

In the laparotomy group, the reasons for applying reanastomosis were disease in another child in 4 patients (13.8%), societal beliefs in 14 (48.3%), desire for another child in 7 (24.1%), and because of pelvic pain in 4 (13.8%).

In the laparoscopy group, the reasons for applying reanastomosis were desire of a new spouse for a child in 2 (28.6%), disease in another child in 1 (14.2%), desire for another child in 1 (4.2%), and because of pelvic pain in 3 patients (42.8%).

Of the patients who underwent laparotomic reanastomosis, 15 (51.7%) refused HSG. In the patients where HSG was applied, open bilateral tubes were observed in 9 (31%) and a single tube was observed to be open in 5 (17.2%). HSG was refused by 2 (28.6%) of the laparoscopic reanastomosis patients. In the patients where HSG was applied, open bilateral tubes were observed in 1 (14.3%), closed bilateral tubes were observed in 2 (28.6%) and a single tube was observed to be open in 2 (28.6%). HSG was not applied to a total of 17 patients and in this group the reasons for reanastomosis were societal beliefs in 10 (58.8%), pain in 2 (11.8%), desire for another child in 3 (17.6%), desire of a new spouse for a child in 1 (5.9%), and disease in another child in 1 case (5.9%).

At the end of the 2-year follow-up of the patients who underwent laparotomic reanastomosis, no pregnancy had been achieved in 20 (69%), abortus in 4 (13.8%), ectopic pregnancy in 1 (3.4%) and a live birth in 4 (13.8%) cases. In the laparoscopic group the 2-year follow-up outcomes were no pregnancy in 5 (71.4%), ectopic pregnancy in 1 (14.3%), and live birth in 1 (14.3%) case ( $p > 0.005$ ) (Table 2).

Table 2. Results of Reanastomosis

	L/T (n=29)	L/S (n=7)	p value
Unsuccessful result	20 (%69)	5 (%71.4)	0.445
Abortus	4 (%13.8)	0 (%0)	
Ectopic pregnancy	1 (%3.4)	1 (%14.3)	
Live Birth	4 (%13.8)	1 (%14.3)	

## Discussion

Tubal sterilisation is a highly reliable method, but one of the most important problems that may be encountered afterwards is regret. This regret has directed investigation into the reasons for the choice of reanastomosis. Basic factors playing a role in the feeling of regret are the young age of the woman, second marriage, the death or illness of another child, no desire of the spouse for children, the decision made hastily, the decision made under stress, family pressure, and societal or religious beliefs. The strongest of these factors is the woman's age [11]. In a CREST study, the possibility of feeling cumulative regret after the procedure was reported as 4% in the 3rd year, 8% in the 7th year, and it increased to 13% at the end of the 14th year [12]. In the current study, the decision for reanastomosis was taken by the patients within mean 6.4 years. When the reasons for reanastomosis were examined, the leading reason was determined as societal beliefs (38.9%). These data are of great importance in showing to what extent an individual's health and health-related decisions can be affected by societal beliefs.

In previous studies related to tubal reanastomosis outcomes, the time to achieving pregnancy has been reported as 95 months, 13.6 months and 18 months [13-15]. In some studies, it has been stated that pregnancy rates reach a plateau 3 years after reanastomosis [16].

Studies have also investigated the method applied apart from

pregnancy rates and the time taken to achieve pregnancy and the pregnancy rates of laparoscopy have been found to be similar to those obtained with laparotomy [17].

In a study by Cetin et al of 134 patients who had previously undergone tubal sterilisation, comparisons were made of a group with laparoscopic tubal reanastomosis with a group who underwent IVF and the pregnancy rates were found to be higher in the tubal reanastomosis group [18]. In the current study, live births were achieved in 4 (13.8%) of the 29 patients to whom laparotomy was applied and in 1 (14.3%) of the 7 patients to whom laparoscopy was applied. IVF treatment was only applied to 1 patient but pregnancy was not achieved. The reason for reanastomosis in the vast majority of the study population was their beliefs and as there was a limited number of laparoscopy cases, this rate can be considered to be low. Previous studies have reported that laparoscopy was a good choice as there was less tissue trauma and it led to fewer adhesions. Some of those studies have reported pregnancy rates of 55.2%-77% in patients to whom laparoscopic reanastomosis had been applied [13, 18]. In a meta-analysis which compared the cost-effectiveness and pregnancy rates of IVF and tubal reanastomosis, 2,256 cases of tubal reanastomosis were examined. The most significant prognostic factor was again determined as age, and tubal reanastomosis was determined to be more advantageous in terms of both pregnancy rates and cost-effectiveness [19].

Another point which requires evaluation after reanastomosis is the risk of ectopic pregnancy. In an extensive meta-analysis which compared tubal reanastomosis with laparotomy and laparoscopy, no difference was determined between the 2 groups in respect of ectopic pregnancy rates [17]. In studies which have compared tubal reanastomosis and IVF, no difference has been determined in respect of ectopic pregnancy rates. In the current study, ectopic pregnancy occurred in 1 patient of each group. Although an evident difference is seen when these results are considered as percentages (3.4% vs 14.4%), as the number of cases in the laparoscopy group was 7, the comparability of the data is limited. Although no statistically significant difference was determined, as no complications were encountered in the laparoscopy group, this renders it a first choice.

Postoperative follow-up of the patient is just as important as the choice of method. To refer the patients for evaluations of tubal opening after surgery is extremely important. Hysterosalpingography, transvaginal hydrolaparoscopy or laparoscopy combined with chromopertubation are recommended for this [1]. In the current study, 15 (51.7%) of the patients who underwent laparotomic reanastomosis refused HSG. In the patients where HSG was applied, open bilateral tubes were observed in 9 (31%) and a single tube was observed to be open in 5 (17.2%). HSG was refused by 2 (28.6%) of the laparoscopic reanastomosis patients. In the patients where HSG was applied, open bilateral tubes were observed in 1 (14.3%), closed bilateral tubes were observed in 2 (28.6%), and a single tube was observed to be open in 2 (28.6%). As the majority of the cases in the current study stated societal beliefs as their reason for wanting reanastomosis, this can be considered to be the cause of the low rate of HSG.

In conclusion, prior to tubal reanastomosis it is necessary to take a detailed anamnesis, access the data of the tubal sterili-

sation operation, and present the laparoscopic method to the patient as a minimally invasive option. When managing the ideas of the possibility of pregnancy, it is important that age, BMI, additional diseases, and other factors affecting fertility are taken into account and that laparoscopic tubal reanastomosis is currently a very effective and reliable method.

### Competing interests

The authors declare that they have no competing interests.

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